Exercise walk-through

1.1 Biological psychology: evidence and transfer

GRE · GRE Subject Test · GRE Psychology

Sensation and perception

- **Sensation** is the reception of stimulation: receptors convert energy into neural signals.
- Perception is the interpretation of those signals, using context and expectation.
- Signal detection theory separates how well a person can detect a signal (sensitivity, d') from how willing they are to say "yes" (the criterion). Rewards and expectations move the criterion.

Sleep

- Sleep is timed by two processes: a roughly 24-hour **circadian rhythm** , set by the suprachiasmatic nucleus and light, and sleep pressure that builds while we are awake.
- A night has cycles of about 90 minutes, through stages of non-REM sleep and REM sleep. Deep slow-wave sleep is greatest early in the night, REM later.
- REM sleep brings vivid dreams, rapid eye movements and paralysed muscles.

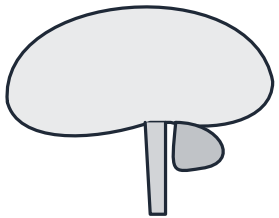
Motivation and emotion

- Hunger: the hypothalamus integrates signals such as blood glucose and hormones from fat and the gut. In rats, damage to the lateral hypothalamus reduces eating; damage to the ventromedial area leads to overeating.
- James–Lange theory: emotion follows awareness of the body's response. Cannon–Bard: body response and emotion happen together. Schachter–Singer two-factor theory: arousal plus a cognitive label produces emotion.
- Hormones and nerves interact with the environment; one hormone or one area rarely explains a behaviour fully.

Exercise 2.1

2.1 Reporting a sound when no sound was presented is a: [1]

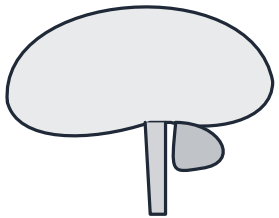
A. hit B. false alarm C. correct rejection



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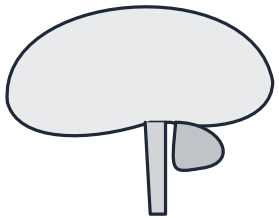


2.1 Answer: B. It is a positive response on a noise-only trial. The other options do not satisfy the stated defining conditions.

Exercise 2.2

2.2 A neuron sends an electrical signal along its: [1]

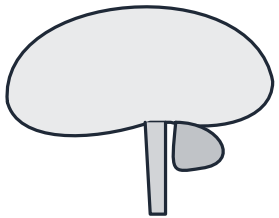
A. axon B. questionnaire C. retina only



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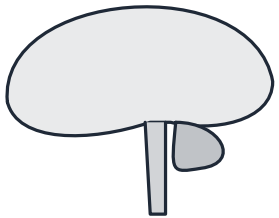
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2.2 Answer: A. Axons conduct action potentials toward terminals. Compare the exact process, design or evidence, rather than an associated keyword.

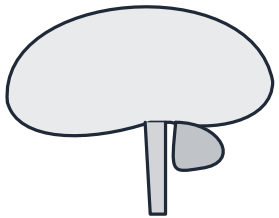
Exercise 2.3

2.3 Revisit the worked case. State one conclusion its evidence supports and one stronger conclusion it does not support. Explain the difference. [2]



Exercise 2.3

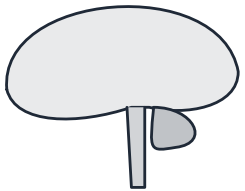
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2.3 Use the worked case evidence to support a bounded claim and explain why a causal, universal or stronger claim needs additional evidence. The claim must fit the specific design and observed process.

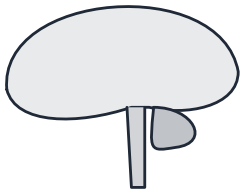
Exercise 3.1

3.1 A participant sleeps little before a memory scan. Recall falls and one region is less active. Give two competing explanations and a design improvement. Give the interpretation, supporting reasoning, a relevant alternative or limitation, and an appropriate check. [4]



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3.1 Reduced sleep could affect memory processing, or stress/effort could affect both recall and activity. Compare ethically approved sleep conditions with standardized tasks and measured confounders; randomize condition order where suitable. Even then, a regional association does not establish that the region alone stores memories. Award B1 each (authored) for the interpretation, its reasoning, a relevant limitation/alternative and an appropriate check, up to four points. Accept a different justified answer satisfying these demands.